

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

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APPLICATIONS

Task 86, Phase III
July 27, 1970

EFFECTIVENESS ANALYSIS
OF HELICOPTER PATROLS
VOL. I: SUMMARY

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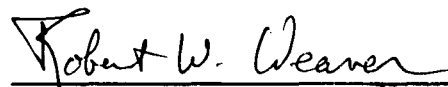
JET PROPULSION LABORATORY
CALIFORNIA INSTITUTE OF TECHNOLOGY
PASADENA, CALIFORNIA

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EFFECTIVENESS ANALYSIS
OF HELICOPTER PATROLS
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SECTION I

INTRODUCTION

Increases in crime and greater demands for police services have led the Los Angeles Police Department (LAPD) to look for new and better methods of controlling crime and serving the public more effectively. To this end, the LAPD decided early in 1968 to test the use of helicopters in a new role or phase of police work - specifically, as a patrol vehicle.

In the past, helicopters have been used in police work largely in support of the traffic control function. Only recently have they been used in patrol work. Little documentation exists on how effective they are in this function. Much of what does exist is highly subjective, being concerned more with specific cases and examples than with overall effectiveness. In other words, the results have not been reported in a manner that relates to goal achievement. Consideration of the overall effectiveness has suffered because of a lack of qualified "control" data to which test results could be compared. This lack of information extends beyond repression of crime to support in the apprehension of offenders, maintaining the public order, and so on. Similarly, there is little information relating the effectiveness of the helicopter to the socioeconomic environment in which it is operated. In the past, helicopters were used in so-called bedroom communities, in which the requirements imposed on the police differ greatly from those in the central city and high-crime areas.

Subsequent to the decision by the LAPD to initiate helicopter patrol flights in the city, it became obvious that a concentrated effort must be made to clearly evaluate the new use of this system. Further helicopter procurements and their deployment will be strongly dependent on the results of this evaluation. It was therefore important to examine helicopter patrols in more detail than had been done in the past, to attain a more quantitative expression of their effectiveness.

The Los Angeles Police Department and the California Institute of Technology's Jet Propulsion Laboratory, with the approval of the National Aeronautics and Space Administration, agreed that JPL would evaluate the effectiveness of helicopter patrols. This study was performed by the Space Technology Applications Office of JPL using evaluation techniques developed from space projects.

Planning and preparation for the patrol activities were conducted in the last half of calendar year 1968.

SECTION II

OBJECTIVES

This study* is being conducted to objectively evaluate the effectiveness of the helicopter patrols used by the Los Angeles Police Department (LAPD) in two of its divisions in 1969; to relate the resulting effects, if possible, to the demography of the areas in which the test program was conducted; and to determine what measures can be taken to increase the effectiveness of the helicopter units.

The present interim report describes progress toward these objectives to date.

*This report is in three volumes. Volume I summarizes the approach used and the results. Volume II presents the full study, and Volume III contains background material and some of the data too voluminous for Volume II.

SECTION III

DESCRIPTION OF HELICOPTER PATROL TEST PROGRAM

A test program was conducted in which helicopters were used in patrol work in 2 of the LAPD's 17 divisions throughout calendar 1969. The University and West Valley Divisions were selected as test divisions for this program because of their differences in crime characteristics and demography (Table 1). The patrols were initiated as day-watch flights, on January 2, 1969, and extended to the night watch on February 26, 1969. The period of activity for purposes of evaluation consists of the full calendar year 1969.

Table 1. Crime and demographic characteristics
in the test divisions - 1968

Characteristics	West Valley	University
Crime*/square mile	231	1485
Crime*/street mile	19	66
Crime*/1,000 population	48	103
Area (sq. mi.)	55	13
Population/sq. mi.	4700	16,500
Business/sq. mi.	32	120
Race - % White	99	16
% Black	Nil	72
% Mex-Amer. & Oriental	1	12
% Single family dwellings	95	73
% Own dwelling	83	57
% Family income greater than \$10,000	75	25
Male head of household - % greater than high school education	66	35
No male head of household - %	6	22
*Part I crime offenses, which includes murder, rape, aggravated assault, robbery, burglary, theft and auto theft.		

The helicopter patrol operated within the police system as a tool at the disposal of the division commander, and was subject to all of the constraints imposed by the police system. The helicopter patrol was therefore dependent upon the present communications system, the present chains of command and the special instructions of the divisional commanders. The helicopter patrol was also dependent on the present ground patrol units to complete any call for service since the helicopter was not permitted to land. It is therefore emphasized here that, in reality, it is the effectiveness of the helicopter-car patrol team that produced the measurable results for analysis.

Table 2 summarizes the differences that existed between the two test divisions in factors relevant to the present study. Except for manpower changes, these factors remained constant during 1969 in all LAPD Divisions except Van Nuys, where the following changes occurred: (1) A control system known as LEMRAS (Law Enforcement Manpower Resources Allocation System) was instituted. This system uses weekly crime data to forecast where extra units should be deployed to counter expected crime. (2) Van Nuys Division received 15 additional black-and-white patrol units in 1969. Table 3 shows the manpower changes that took place in LAPD divisions during 1968-1969.

Three types of data were gathered for analysis in this study:

- 1) Crime statistics for all divisions were obtained, so as to determine the performance of the test divisions relative to the other divisions, and to validate the crime prediction technique.
- 2) Information was obtained on the number of times the helicopter patrol responded to calls for service or observed suspicious actions, in order that the extent of the helicopter patrol's participation in police functions could be determined. This information was obtained from the flight logs maintained on each flight. (Only the results of the first six months of flight log data are presented in this report.)

- 3) Two opinion polls were conducted in the test divisions to measure the public and police attitudes toward the helicopter patrols. The first was a poll of the policemen that patrol the divisions in ground units and the second was a poll of the residents and businessmen living and working there.

Table 2. Differences between test divisions

University	West Valley
Deployed manpower per 1000 population: 0.7	Deployed manpower per 1000 population: 0.4
Patrol cars ⁽¹⁾ : 33	Patrol cars ⁽¹⁾ : 36
Single radio receiver per car except in supervisory vehicles	Extra radio receiver in every car
Two men per car	One man per car
Average service time ⁽²⁾ of personnel in division: Low	Average service time ⁽²⁾ of personnel in division: Average
Division commander changed during test period	Division commander was the same for test year
Division commander utilized a special operations squad	No special operations squad utilized
CTF ⁽³⁾ man-days expended in division during 1969: 4553	CTF ⁽³⁾ man-days expended in division during 1969: 621
<p>(1) Marked patrol units.</p> <p>(2) Compared to all divisions.</p> <p>(3) The Crime Task Force (CTF) is a special unit, controlled by LAPD headquarters. It is assigned when a high rate of crime occurs in a particular division. The unit's efforts are generally directed toward a specific crime. As can be seen, this unit expended approximately seven times more man-days in University Division than in West Valley Division.</p>	

Table 3. Change in operational man-days expended* -
1969 from 1968

<u>Division</u>	<u>Percent Change</u>
Central	-15
Rampart	+4
University	+2
Hollenbeck	-7
Harbor	-7
Hollywood	+7
Wilshire	+4
West L. A.	+3
Van Nuys	-8
West Valley	-6
Highland Park	-9
77th Street	+4
Newton	-1
Venice	+15
North Hollywood	+2
Foothill	+1
Devonshire	-6

*Operational man-days expended is defined as the sum of divisional man-days and CTF man-days.

SECTION IV

METHOD OF ANALYSIS

A. INTRODUCTION

To be meaningful, the "effectiveness" of helicopter patrols must be evaluated in terms of (1) the accomplishment of basic police system objectives and (2) the benefits or deficits that may accrue to the community and police from such patrols. The basic police system objectives are:

- 1) Control and reduction of crime: crime prevention, crime repression, apprehension of offenders, recovery of property.
- 2) Movement and control of traffic: traffic movement, traffic safety, accident investigation.
- 3) Maintenance of public order: public events, minor disturbances, civil disorder.
- 4) Provision of public services: emergency, missing persons, lost property, miscellaneous.

Table 4 contains a partial listing of subjects for benefit/deficit consideration.

The subjective nature of many of the determinations involved in evaluating helicopter patrol effectiveness precludes seeking a purely statistical or numerical overall result. Accordingly, a threefold analytical approach was taken: (1) development and application of a statistical procedure for evaluating selected, quantifiable aspects of helicopter patrol work (the statistical method is described in paragraph IV-B), (2) determination of the extent of the helicopter patrol's participation in total divisional law enforcement activities (this information to be derived from flight log data), and (3) an assessment of the results of public/police opinion polls concerning helicopter patrols.

Table 4. Subjects for benefit/deficit consideration in evaluating helicopter patrol effectiveness

Community	Police
Personal and property safety	Officer safety
Taxes	Economy
Insurance rates	Retention of personnel
Police/community relations	Morale
Civil rights	Recruitment

Of the police system objectives and the benefit/deficit considerations, only the "control and reduction of crime" objective was analyzed statistically. It was selected because (1) most of the results are readily quantifiable and (2) it was the objective toward which the helicopter patrol program was directed.

The "control and reduction of crime" function consists of four elements:

- 1) Crime prevention. Determination of the factors in community life which create criminal tendencies and lead to continued delinquent social behavior, with the objective of eradicating these causes.
- 2) Crime repression. Making crime more hazardous to the criminal by increasing the probability of arrest and successful prosecution, and reducing or eliminating opportunities to commit crime.
- 3) Apprehension of offenders. Investigation of crimes, obtaining evidence, arresting and booking suspects, and providing evidence.
- 4) Recovery of property. Recovering stolen property, including autos, personal and commercial property.

Of these four elements, only crime repression and apprehension of offenders were selected for statistical analysis. The reasons for this are the same as for selecting the "control and reduction of crime" objective, i.e., the results are quantifiable.

B. STATISTICAL ANALYSIS TECHNIQUES

1. Crime Prediction Technique

To determine the effect of the helicopter patrols on crime repression and the apprehension of offenders in the test divisions, a set of comparison or "control" data was needed. An attempt was made to select a nontest division as a control but this proved unrealistic for several reasons. Divisions adjacent to the test divisions would be subject to effects resulting from the test division's proximity, such as helicopter overflights and an outflow of criminal activity from the test divisions. Other LAPD divisions not adjacent to the test divisions were found to be adjacent to other jurisdictions that do use helicopter patrols. The remaining divisions were too dissimilar to the test divisions to be valid control divisions.

It was decided to use the two test divisions as their own controls. To do this, it was necessary to predict the number of offenses and arrests that would have occurred in the test divisions had the helicopters not been introduced nor any other abnormal changes made in the police system. Differences between the actual and predicted occurrences could then be used in assessing the effectiveness of the patrols.

To test the validity of the prediction technique, predictions were made for all 17 LAPD divisions, and for selected combinations of the divisions, for the Part I crimes of robbery, burglary, theft and auto theft, both offenses and arrests. The accuracy of these predictions, made for the nontest divisions, thus provides a measure of confidence for those made for the test divisions.

Since a true causal model for predicting crime is still to be developed, the following approach, using solely time-series of data, was taken. This approach can be made clearer by describing the steps:

- 1) Establish a data base. Data was obtained for the years 1961-1968 for each type of crime, both offenses and arrests, by reporting district, and by quarter-year. The data was then recombined,

taking into account all boundary changes, into data for the police divisions as they were constituted in 1969. This provided an accurate time-series for each division and crime type.

- 2) Define the prediction models. Three baseline models were selected: linear, quadratic, and logarithmic. Two parameter estimation techniques were used: multiple regression analysis and exponential smoothing. Using these basic combinations, a total of 54 different prediction models were defined.
- 3) Model selection. The 54 models were applied to each of the time-series. Only data from 1961 through 1966 were used, and predictions were then made for 1967 and 1968. Variances were determined and a "best" model was selected for each time-series.
- 4) Generate predictions for 1969. The selected best-fit model for each combination of crime-type and police division was then applied to the full 8-year data base for that same crime type and division to generate a set of predictions, by quarters, for 1969.

Using the resulting predictions and their associated uncertainties, a comparison to actual data was made. The deviations from the predictions were then used to determine the helicopter effectiveness in the test divisions. This comparison was also made in the non-test divisions, so as to assess the validity of the prediction technique.

A significance level was chosen that gave 90% confidence that the difference between the actual and predicted number of occurrences could not have occurred by random chance. Only the deviations from the predicted number of occurrences that exceeded this level of significance were considered in the evaluation.

The results in the non-test divisions were investigated to determine if the prediction techniques were valid. This entailed determining whether the deviations found in the non-test divisions could be explained as resulting from system changes (e.g., manpower changes) known to have taken place in those divisions. The results for the test divisions were then examined to see if they were influenced by similar changes. Where possible the results in the test divisions

were explained in light of the other changes that were measured in the test divisions. Using these techniques, the changes in crime due to the helicopter patrol were determined.

The number of significant deviations in the non-test divisions indicates the confidence level that can be attributed to the prediction technique used.

2. Crime Trend Analysis

Since the number of occurrences predicted by the model is a function of the past actual occurrences, a comparison of 1969 data with that for 1968 or earlier is redundant. There is, however, another technique that indicates effectiveness and that is the rate of change of occurrences. This value is determined by finding the increase (or decrease) of occurrences in percent of the previous year's occurrences. A comparison of several years of these data indicates what is happening to the general trend in that crime.

SECTION V

RESULTS

A. COMPARISON - PREDICTED VS ACTUAL OCCURRENCES

Significant* deviations from the predicted values are shown in Tables 5 and 6 for offenses and arrests, respectively. Each table represents the results of 480 predictions. In the offense table there are 43 significant deviations and in the arrests table, 39. The small number of significant deviations indicates that the prediction technique used is valid for the purposes of this study.

Table 7 compares the manpower changes with the number of significant deviations from predicted values in robbery, burglary, theft and auto theft offenses. Table 8 shows the arrests made by CTF in each division.

Examining Tables 5-8, the following is observed:

- 1) West Valley Division, which had a 6% reduction in effective manpower, accounted for one-third of all instances in the city in which a significant lower-than-predicted offense level occurred.
- 2) Of the non-test divisions that had manpower reductions, only Van Nuys and Harbor Divisions had significantly fewer offenses than predicted. The Van Nuys results were most likely influenced by the introduction of LEMRAS and additional patrol cars. The cause of the Harbor Division results is not apparent in the findings of this study.
- 3) University Division, which had a 2% increase in effective manpower, showed three instances in which a significant lower-than-predicted offense level occurred.
- 4) Of the non-test divisions having similar manpower increases, only Foothill fared better than University. The cause of the Foothill results is not apparent from the findings of this study.

*As defined on page 12.

Table 5. Significant* results summary - offenses

(Number of calendar quarters in which actual occurrences were significantly above or below (+ or -) prediction.)

Division	Robbery	Burglary	Theft	Auto Theft	Total Property
Central	0	+1	0	0	+1
Rampart	+1	0	0	0	0
University ⁽¹⁾	-2	0	0	-1	0
Hollenbeck	0	0	0	0	0
Harbor	0	-2	0	-2	0
Hollywood	+1	0	0	-1	0
Wilshire	0	+1	0	0	0
West L. A.	0	0	0	0	0
Van Nuys	0	0	-1	-1	-1
West Valley ⁽¹⁾	-2	0	-4	-3	-3
Highland Pk.	0	0	0	0	-1
77th Street	-1	0	0	0	-1
Newton	0	0	0	0	0
Venice	0	-2	0	0	0
N. Hollywood	0	0	0	0	0
Foothill	-3	0	-2	0	-1
Devonshire	+1	0	0	0	0
Area 2 ⁽²⁾	0	0	0	0	0
Area 3 ⁽³⁾	0	0	0	0	0
Area 4 ⁽⁴⁾	-1	0	-1	0	-1
Area 5 ⁽⁵⁾	0	0	0	0	0
Area 2 minus University	0	0	0	0	0
Area 4 minus West Valley	0	0	0	0	0
L. A. Total	0	0	0	0	0

Note: Minus values are favorable.

(1) Test divisions.

(2) Area 2 contains University, Wilshire, 77th Street and Newton Divisions.

(3) Area 3 contains Central, Rampart, Hollenbeck, Hollywood, and Highland Park Divisions.

(4) Area 4 contains Van Nuys, West Valley, North Hollywood, Foothill, and Devonshire Divisions.

(5) Area 5 contains Harbor, West Los Angeles, and Venice Divisions.

*As defined on page 12.

Table 6. Significant* results summary - arrests

(Number of calendar quarters in which actual occurrences were significantly above or below (+ or -) prediction.)

Division	Robbery	Burglary	Theft	Auto Theft	Total Property
Central	0	0	+1	0	0
Rampart	0	0	0	0	0
University ⁽¹⁾	0	-1	0	0	0
Hollenbeck	0	+2	0	+2	+3
Harbor	0	0	0	0	0
Hollywood	+1	-2	0	+1	0
Wilshire	+1	-1	-1	0	0
West L. A.	-1	+1	+2	0	+1
Van Nuys	0	0	0	0	0
West Valley ⁽¹⁾	+1	-1	0	0	-1
Highland Pk.	0	0	0	0	0
77th Street	0	0	0	0	0
Newton	0	0	0	+2	0
Venice	+1	0	0	0	0
N. Hollywood	+1	0	0	0	0
Foothill	0	0	0	0	-2
Devonshire	+1	0	+1	0	0
Area 2	0	0	0	0	0
Area 3	0	0	+1	0	0
Area 4	+1	-2	0	0	0
Area 5	0	+1	+2	0	0
Area 2 minus University	0	0	0	0	0
Area 4 minus West Valley	0	0	0	0	0
L. A. Total	0	0	0	0	0

Note: Plus values are favorable.

(1) Test divisions.

* As defined on page 12.

Table 7. Comparison of significant deviations with changes
(1969 vs 1968) in operational man-days expended*

Division	% Change in Manpower	Number of Significant ⁽¹⁾ Deviations in Offenses (in calendar quarters)
Central	-15	+1
Rampart	+4	+1
University	+2	-3
Hollenbeck	-7	0
Harbor	-7	-4
Hollywood	+7	+1, -1 ⁽²⁾
Wilshire	+4	+1
West L. A.	+3	0
Van Nuys	-8	-2
West Valley	-6	-9
Highland Pk.	-9	0
77th Street	+4	-1
Newton	-1	0
Venice	+15	-2
N. Hollywood	+2	0
Foothill	+1	-5
Devonshire	-6	+1
<p>Note: Minus deviations are favorable.</p> <p>(1) As defined on page 12.</p> <p>(2) Robbery deviation was positive, auto theft was negative.</p>		

*Operational man-days expended is defined as the sum of divisional man-days and CTF man-days.

Table 8. CTF arrests in 1969

Division	Robbery		Burglary		Auto Theft	
	Number	% of Division* Arrests	Number	% of Division* Arrests	Number	% of Division* Arrests
Central	5	1	5	1	4	1
Rampart	10	3	19	3	11	2
University	74	11	<u>54</u>	4	67	7
Hollenbeck	3	2	<u>4</u>	1	<u>3</u>	1
Harbor	0	0	2	1	0	0
Hollywood	<u>60</u>	14	<u>44</u>	5	<u>69</u>	12
Wilshire	<u>52</u>	10	<u>42</u>	6	27	5
West L. A.	<u>1</u>	1	<u>3</u>	1	10	6
Van Nuys	5	3	9	2	4	2
West Valley	<u>8</u>	7	<u>0</u>	0	2	1
Highland Pk.	0	0	0	0	0	0
77th Street	98	8	90	4	116	6
Newton	13	3	5	1	<u>17</u>	3
Venice	<u>3</u>	2	12	3	8	3
N. Hollywood	<u>0</u>	0	2	1	6	3
Foothill	1	0	12	2	9	3
Devonshire	<u>7</u>	16	3	1	5	5
Note: Circled values indicate a crime/division combination for which one or more quarters showed a significant deviation from the predicted value. The flagged circles indicate unfavorable deviations.						
*Percentage of the 1969 total division arrests for the specified crime by the CTF.						

- 5) In the arrest results, unfavorable significant results occurred in both test divisions in burglary. In West Valley, in one quarter in robbery, there was a favorable result.
- 6) The cause of the results in arrests in the non-test divisions is not apparent from the findings of this study.

B. CRIME TRENDS

Tables 9 and 10 show the rate of change in offenses and arrests, respectively, over the last 7 years, for the test divisions, the areas surrounding the test divisions, and the city as a whole.

1. Offenses

From Table 9 it is observed that:

- 1) In 1969, except in burglaries in University Division, both test divisions reversed their historical upward trends in offenses.
- 2) The divisions surrounding the test divisions and Los Angeles as a whole (L.A. Total) did not, except in auto theft in Area 2, experience this reversal in offenses.

2. Arrests

The data in Table 10 indicate that there is no pattern in the trends in arrests and thus no firm conclusions can be drawn.

Table 9. Rate of change of offenses - % change from prior year

	Year						
	63	64	65	66	67	68	69
ROBBERY							
University	+11	+1	+11	+1	+35	+10	-2
Area 2* minus University	+1	+4	+15	+1	+40	+2	+8
West Valley	-21	+91	+50	-15	+22	+64	-19
Area 4** minus West Valley	+29	+4	+29	+8	+8	+41	0
L. A. Total	+3	+6	+19	-1	+25	+14	+5
BURGLARY							
University	+22	-1	+14	+6	-4	+15	+8
Area 2 minus University	+6	-1	+20	+6	+14	+3	+8
West Valley	+2	+34	+29	+17	+5	+4	-5
Area 4 minus West Valley	+14	+12	+26	+16	+2	+8	-6
L. A. Total	+9	+4	+18	+10	+7	+6	+3
THEFT							
University	+6	+6	+1	+1	-1	+17	-2
Area 2 minus University	+5	+10	+5	-1	+3	+6	+2
West Valley	+11	+31	+23	+15	+9	+12	-8
Area 4 minus West Valley	+8	+16	+15	+8	+7	+10	-1
L. A. Total	+4	+13	+7	+5	+6	+8	+3
AUTO THEFT							
University	+7	+18	+4	-3	+21	+27	-8
Area 2 minus University	+5	+22	+7	-3	+14	+30	-3
West Valley	+1	+23	+33	+14	+15	+11	-4
Area 4 minus West Valley	+13	+7	+22	+21	-1	+30	0
L. A. Total	+5	+16	+13	+5	+9	+26	+1
TOTAL PROPERTY							
University	+11	+5	+7	+1	+4	+17	0
Area 2 minus University	+5	+8	+11	+2	+11	+8	+3
West Valley	+7	+31	+27	+15	+8	+10	-6
Area 4 minus West Valley	+11	+13	+19	+12	+4	+12	-2
L. A. Total	+6	+10	+12	+7	+8	+10	+3
*Area 2 contains University, Wilshire, 77th Street and Newton Divisions. **Area 4 contains West Valley, Van Nuys, North Hollywood, Foothill and Devonshire Divisions.							

Table 10. Rate of change of arrests - % change from prior year

	Year						
	63	64	65	66	67	68	69
ROBBERY							
University	-23	-4	+21	-16	+26	+4	+4
Area 2* minus University	+2	-14	-4	-15	+51	+14	0
West Valley	(Values not meaningful due to small number of occurrences)						+6
Area 4** minus West Valley						+16	+27
L. A. Total	-5	-7	0	-14	+35	+13	+3
BURGLARY							
University	0	-12	+75	-28	-4	+34	-7
Area 2 minus University	-8	-11	+64	-39	+8	+8	+8
West Valley	+9	+6	+34	+14	+20	+15	-27
Area 4 minus West Valley	+12	-3	+7	+17	+14	+6	+6
L. A. Total	+2	-9	+30	-21	+11	+14	-7
THEFT							
University	-14	-8	-1	-6	+7	+18	+2
Area 2 minus University	+2	+14	+5	-15	+21	+10	0
West Valley	+22	+11	+65	+8	-16	+22	-11
Area 4 minus West Valley	+13	+9	-7	+11	+6	-3	+3
L. A. Total	+7	+10	+3	-3	+8	+6	+7
AUTO THEFT							
University	-6	+20	-10	-4	+19	+53	-2
Area 2 minus University	+15	+30	-12	-13	+17	+43	+11
West Valley	-4	+6	+29	-9	-16	+5	+13
Area 4 minus West Valley	+5	-5	+16	+10	-3	+26	+2
L. A. Total	+7	+16	-7	-1	+5	+41	+9
TOTAL PROPERTY							
University	-10	-3	+25	-17	+9	+28	+2
Area 2 minus University	0	+1	+20	-26	+20	+18	+5
West Valley	+8	+10	+45	+7	0	+15	-9
Area 4 minus West Valley	+11	+2	+3	+13	+7	+7	+6
L. A. Total	+3	+1	+10	-11	+12	+16	+6
<p>* Area 2 contains University, Wilshire, 77th Street and Newton Divisions.</p> <p>** Area 4 contains West Valley, Van Nuys, North Hollywood, Foothill and Devonshire Divisions.</p>							

C. OPERATIONAL INVOLVEMENT IN PART I CRIMES

The types of calls the helicopter responded to and the results of those responses were determined from the helicopter patrol flight logs for the first six months of operation in 1969.

Table 11 shows the percentage of the total number of responses to calls by the helicopter patrol that were for the different types of calls for service.

Table 11. Responses to calls for service in percent
of total calls

	University		West Valley	
	Day	Night	Day	Night
Part I Crime	65	78	78	65
Part II Crimes	12	16	11	22
Public Order	17	11	6	7
Public Service	3	2	3	2
Traffic Safety	3	3	2	4
Total	100	100	100	100

The helicopter patrol crew monitors the radio frequencies in the division in which they are operating and determines which calls they will respond to. The criterion for response is that there is a good prospect of effecting an arrest. Therefore the helicopter is responding to those calls where the offender is most likely to still be at the scene. This type of call is the most hazardous for the ground unit officer. The helicopter's speed affords the unit the advantage of the fast response time required to get to the scene of the crime.

Table 2 indicates the helicopter patrol units responses to the four Part I property crimes as a percentage of the division's reported offenses for those crimes in the same time period.

Table 12. Helicopter patrol confirmed responses* to Part I property crimes in percent of total division reported offenses

Division	Robbery	Burglary	Theft	Auto Theft
University	12.2	3.2	2.3	2.5
West Valley	20.6	3.7	0.5	4.3

*Responses in which the crime committed was found to be the same crime as stated in the call for service.

Typically, the helicopter patrol unit remains on the scene until released by the ground unit or the helicopter crew determines they can be of no further benefit to the ground unit. The ground unit releases the helicopter unit when an apprehension is made or is certain. In the flight logs the apprehension would be recorded as an arrest made but the number of suspects apprehended is not always known to the helicopter crew. Table 13 indicates the number of apprehension situations as a percent of the total divisional arrests made for the Part I property crimes.

Table 13. Apprehensions with helicopter patrol present in percent of division arrests for Part I Property Crimes.

Division	Robbery	Burglary	Theft	Auto Theft
University	5.0	7.0	6.5	5.9
West Valley	7.9	10.8	1.9	19.4

The number of times an apprehension was made in percent of total calls responded to by the helicopter patrol unit is shown in Table 14.

Table 14. Percent of calls responded to by helicopter patrol when an apprehension was made.

Division	Robbery	Burglary	Theft	Auto Theft
University	19	51	47	72
West Valley	27	47	40	75

D. POLICE AND PUBLIC OPINION POLLS

1. Public Opinion Poll

The public opinion poll was conducted in two segments, the first being a survey of residents, conducted between February 10 and 18, 1970, and the second a survey of the businessmen in the test divisions. This entire effort was carried out by General Behavioral Systems, Inc. (GBS) of Torrance, California, under contract to the Jet Propulsion Laboratory. The GBS report is in Volume III. Related tabulated data is not presented here but is on file at JPL. A summary of the results is presented here to show the general attitudes of the public.

It was found that the residential public in the test divisions is very aware of the police helicopter patrols. The awareness level is about 84%. Interestingly, a lower percentage, 68%, of the businessmen interviewed were aware that the police fly helicopters over their business locations. In comparison, only 18% of the respondents in areas not having patrols were aware that the police use helicopters.

The most common reaction when a helicopter is heard is that it is the police. In the West Valley, 47% of the residents said the police or police-related activities were their reaction to hearing a helicopter. In the University Division, this reaction was even higher, 63%. The most undesirable feature of the helicopters, to residents, appears to be noise. Lights and danger of accident were ranked much lower. Respondents in both study divisions placed invasion of privacy very low in their overall ranking. Noise was not mentioned, by businessmen, as having an effect, and the most commonly stated good effects mentioned by them were a feeling of protection and reduced crime rate.

The total sample of residents of the test divisions ranked crime prevention and assisting an arrest as more suitable uses for helicopter patrols than rescue work or traffic control. The respondents in the non-test areas ranked rescue work and traffic control higher.

There appears to be considerable public support for the continuation of helicopter patrols in both test divisions. Eighty-nine percent of the total sample of residents favor continuation, with no significant difference between the two divisions. Ninety-three percent of the businessmen favor continuation. The strength of this reaction is better understood when the answers to the question of how much additional tax or rent the respondent was willing to pay to keep the helicopter in the area are examined. Table 15 contains these results. The response of the businessmen to this question was 24% willing to pay one or more dollars.

Needs for educating the public were found both within areas presently served by helicopter patrols and in communities to be served. Special groups requiring special education were found to be young blacks in the University

Table 15. Willingness to pay for helicopter patrol (residential only)

	Amount Per Month	Annual Family Income (\$)							
		Less than 6K		6K to 10K		10K to 15K		Over 15K	
		Number	%	Number	%	Number	%	Number	%
Total	0 to \$1	46	71	41	67	38	58	46	75
	Over \$1	19	29	20	33	27	42	15	25
West Valley	0 to \$1	7	87	16	70	25	53	37	73
	Over \$1	1	13	7	30	22	47	14	27
University	0 to \$1	39	68	25	66	13	72	9	90
	Over \$1	18	32	13	34	5	28	1	10

Division and the well-to-do in the West Valley Division. Both groups need information that show that helicopter patrols meet certain of their needs, without threatening other needs. For the youth of the University Division, there is a need to show that the helicopter patrols provide faster response and are effective in reducing crime without posing a threat to the exercise of civil rights. For the West Valley Division, there is a need to show that the helicopters are effective in providing protection without increasing the net cost to the individual.

A summary of some of the key points is shown in Table 16.

Table 16. Key points of the community poll

	<u>Percent</u>
Awareness of helicopter patrols	
Residents	84
Businessmen	68
Non-test area residents	18
Reaction to hearing helicopter is that it is the police	
University	63
West Valley	47
Continuation of patrols, favorable	
Residents	89
Businessmen	93

2. Police Opinion Poll

The police poll was conducted in August-September of 1969 and therefore does not encompass the full test period. The poll was conducted by the helicopter section of LAPD. The results are discussed here and details presented in Volume III of this report.

The police were almost unanimous in believing that the helicopter was an advantage to their activities, that it should be continued as a patrol vehicle, and that this use should be expanded to other divisions. Three-fourths of the officers said yes when asked if they had been able to apprehend a suspect because of the helicopter. Ninety-six percent of the responses were positive when asked if the helicopter provides any officer security. Much of this was in the officer-needs-assistance, or back-up, category. It tends to divide the attention of a suspect and provides a psychological advantage. There is a decided tendency for suspects to cool down. In talking with suspects, officers report a strong apprehensiveness -- the feeling of not being able to get away, once spotted. Security was provided in another way. When the helicopter responded to a call, 88% of the officers said it was there before a ground unit, 9% said it was at the same time, leaving 3% saying it arrived after the ground unit. The early arrival permitted communicating information on the situation to the responding ground unit.

From a different point of view, however, early arrival causes some problems -- many curable through improvement of operational procedures. Seventeen percent said yes when asked if the helicopter hindered them in any manner. The reason given in the majority of cases was that the noise alerted the suspect, who then knows a radio car is soon to follow. The lights can have the same effect. Noise from the helicopters tends to draw people out-of-doors, hindering investigation or apprehension.

Two-thirds of the officers responded positively to the question, "Is there any equipment which you should have to enable you to make better use of the helicopter?" The near-unanimous answer was improved communications. A summary of the results is shown in Table 17. The complete results of this poll are in Volume III of this report.

Table 17. Results of the police opinion poll

	<u>Percent</u>
Helicopter is an advantage	100
Made an apprehension due to helicopter	75
Provides officer security	96
Helicopter first at scene	88
Helicopter provides some hindrance	17
Need improved communications, etc.	65

SECTION VI

CONCLUSIONS

A. CRIME EFFECTIVENESS

1. Overall

In the test divisions the resulting changes in the trends in the Part I Property Crimes and the number of times the actual offenses committed were significantly lower than the predicted offenses can only be attributed to the helicopter patrol operations. No other changes within the police system were found that could account for these results.

The apparent lack of significant results in the arrest data on a divisional basis does not accurately reflect the results found in the operational analysis. On an operational basis the helicopter-car patrol team effected arrests in 45 percent of the calls responded to. These arrests did not require investigative assistance prior to arrest. The city as a whole makes arrests equal to 16 percent of the total offenses committed, including those made through investigative followups.

2. Specific Crimes and Areas

The results indicate that the helicopter patrol was most effective against robbery, auto theft and theft in the West Valley Division and against robbery and auto theft in the University Division.

The results also indicate a greater effect in the West Valley Division than in the University Division.

3. Operation

The operational results indicate that the helicopter-car patrol team affects almost three times as many arrests as the city as a whole per reported

offense. This provides greater officer security to the ground unit because the helicopter patrol crew selects those calls that present the greatest potential of an arrest being made, thus the criminal is most likely to be at the scene. The fast response time of the helicopter unit further enhances the possibility of making an arrest.

B. OPINION POLLS

1. Public

The residents of the test areas accept the helicopter patrols as a necessary part of the police system and strongly favor the continuation of the patrols.

2. Police

The patrolmen in the test divisions overwhelmingly favor the continuation of the helicopter patrol program and state that officer security is one of the benefits of the patrols.